

**CLEARLAKE OAKS COUNTY WATER DISTRICT
AGENDA, CALL AND NOTICE
REGULAR MEETING OF THE BOARD OF DIRECTORS**

Clearlake Oaks County Water District Administration Building
12952 E. Hwy. 20 Clearlake Oaks, CA 95423 (707) 998-3322

March 3, 2016

This meeting will be conducted by Roberts Rule of Order.

Where appropriate or deemed necessary, the Board may take action on any item listed on the agenda, including items listed as information items. Public documents relating to any open session item listed on this agenda that are distributed to all or a majority of the members of the Board of Directors less than 24 hours before the meeting are available for public inspection in the customer service area of the District's Administrative Office at the above address.

The public may address the Board concerning an agenda item either before or during the Board's consideration of that agenda item. The President will call for comments at the appropriate time. Comments will be subject to reasonable time limits of three minutes.

In compliance with the Americans with Disabilities Act, if you have a disability, and you need a disability-related modification or accommodation to participate in this meeting, then please contact Clearlake Oaks County Water District Secretary to the Board at 707-998-3322. Requests must be made as early as possible, and at least one full business day before the start of the meeting.

Call to Order – 11:00 a.m.

Pledge of Allegiance

Roll Call

Public comment on non-agenda items

This is the opportunity for the public to comment on non-agenda items within the Board's jurisdiction. Comments are limited to three (3) minutes

1. Agenda (Old Business)

- a. Discussion and review of MC Engineering Consulting Contract with MC Engineering

Action Taken: _____

- b. Discussion and consideration of Contract for Consulting Services between District and MC Engineering for the Wastewater Treatment Plant Recycling Study with SWRCB

Action Taken: _____

- c. Discussion and consideration of maintenance and repairs for Lift Station 10

Action Taken: _____

Directors and Committee's Reports and Comments:

Adjournment **Time:** _____

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1.6.1

ATTACHMENT A

GENERAL TERMS AND CONDITIONS

1. Purchase Agreement ("Agreement") Force and Effect. Clearlake County Water District ("District") is not responsible for services rendered without the authority of an agreement on this form. This Agreement shall supersede and control over all inconsistent provisions in any proposal. The provisions of this Agreement (which may include attachments) constitute the entire agreement between the Consultant and District regarding the work and services described herein. No representation, term or covenant not expressly specified in this Agreement shall, whether oral or written, be a part of this Agreement. No modification of this Agreement shall be effective unless it is in writing. This Agreement shall supersede all other prior purchase agreements and agreements between Consultant and District with respect to the work and services described herein. This Agreement may not be modified, nor may compliance with any of its terms be waived, except by written instrument executed and approved by fully authorized representatives of District and Consultant. The headings in this Agreement are for convenience only and do not affect the construction of this Agreement.

2. Performance of Services/No Assignment. Time is of the essence in the performance of the Services. Consultant represents that it is skilled in the professional discipline necessary to perform the Services. Consultant will perform its Services in a skillful manner, comply fully with criteria established by District, and with applicable laws, codes, and all applicable professional standards. Consultant shall not contract any portion of the Services or otherwise assign this Agreement without prior written approval of District. (Consultant shall remain responsible for compliance with all terms of this Agreement, regardless of the terms of any such assignment.) Consultant's authorized representative is the individual signing this Agreement unless Consultant otherwise informs District in writing and the District approves the new person in writing. The granting of any payment, and any inspections, reviews, approvals or oral statements by any District representative, or certification by any governmental entity, shall in no way limit Consultant's obligations under this Agreement.

3. Records and Payment Requests. Consultant shall submit all billings with all necessary invoices or other appropriate evidence of performance, after which District shall make payment within thirty (30) days. District shall have the right to audit the Consultant's work records. Consultant shall make available to District, its authorized agents, officers, or employees, any and all ledgers, books of accounts, invoices, vouchers, cancelled checks, and other records or documents evidencing or relating to the expenditures and disbursement charged to District, for examination. Consultant shall furnish to District, its authorized agents, officers, or employees, such other evidence or information as District may require with regard to any such expenditure or disbursement charged by Consultant. Consultant shall maintain all documents and records prepared by or furnished to Consultant during the course of performing the services for at least three (3) years following completion of the Services, except that all such items pertaining to hazardous materials shall be maintained for at least thirty (30) years. Such records include, but are not limited to, correspondence, internal memoranda, calculations, books and accounts, accounting records documenting its work under this Agreement, and invoices, payrolls, records and all other data related to matters covered by this Agreement. Consultant shall permit District to audit, examine and make copies, excerpts and transcripts from such records. The State of California Water Resources Control Board or any federal or state agency having an interest in the subject of Agreement shall have the same rights conferred to District by this section. Such rights shall be specifically enforceable.

4. Independent Contractor. Consultant is an independent contractor and does not act as District's agent in any capacity whatsoever. Consultant is not entitled to any benefits that District provides to District employees, including, without limitation, worker's compensation benefits or payments, pension benefits, health benefits or insurance benefits. Terms within this Agreement regarding direction apply to and concern the result of the Consultant's provision of Services not the means, methods, or scheduling of the Consultant's work. Consultant shall be solely responsible for the means, methods, techniques, sequences and procedures with respect to its provision of Services under this Agreement. Consultant shall pay all payroll taxes imposed by any governmental entity and will pay all other taxes not specifically identified in this Agreement as District's responsibility.

5. Indemnity/Liability. To the fullest extent permitted by law (including, without limitation, California Civil Code Section 2782), Consultant shall defend (with legal counsel reasonably acceptable to the District), indemnify and hold harmless District and its officers, agents, departments, officials, Board of Directors, representatives and employees (collectively "Indemnitees") from and against any and all claims, loss, cost, damage, injury (including, without limitation, injury to or death of an employee of Consultant or its sub-consultants), expense and liability of every kind, nature and description (including, without limitation, incidental and consequential damages, court costs, attorneys' fees, litigation expenses and fees of expert consultants and/or expert witnesses incurred in connection therewith and costs of investigation) that arise from or relate to, directly or indirectly, in whole or in part, but only to the extent that any of the above arise out of, pertain to, or relate to the negligent or reckless act or omission, or willful misconduct, of Consultant, any sub-consultant, anyone directly or indirectly employed by them, or anyone that they control (collectively "Liabilities"). Such obligations to defend, hold harmless and indemnify any Indemnitee shall not apply to the extent that such Liabilities are caused in whole or in part by the sole negligence or willful misconduct of any Indemnitee.

6. Conflict of Interest. Consultant represents and warrants that it presently has no interest, and shall not have any interest, direct or indirect, which would conflict in any manner with the performance of work and services required under this Agreement. Without limitation, Consultant represents to and agrees with District that Consultant has no present, and will have no future conflict of interest between providing District services hereunder and any interest Consultant may presently have, or will have in the future, with respect to any other person or entity (including but not limited to any federal or state wildlife, environmental or regulatory agency) which has any interest adverse or potentially adverse to District, as determined in the reasonable judgment of District.

7. Confidentiality. Any information, whether proprietary or not, made known to or discovered by Consultant during the performance of or in connection with this Agreement for District, will be kept confidential and not be disclosed to any other person. Consultant will immediately notify District in writing if it is requested to disclose any information made known to or discovered by during the performance of or in connection with this Agreement. These conflict of interest, confidentiality and future service provisions and limitations shall remain fully effective indefinitely after termination of services to District hereunder.

8. Ownership of Results. Any interest (including copyright interests) of Consultant or its sub-consultants (together, "Sub-consultants"), in studies, reports, memoranda, computational sheets, drawings, plans or any other documents (including electronic media) prepared by Consultant or its Sub-consultants in connection with the Services, shall become the property of District. To the extent permitted by Title 17 of the United States Code, work product produced under this Agreement shall be deemed works for hire and all copyrights in such works shall be the property of District. In the event that it is ever determined that any works created by Consultant or its Sub-consultants under this Agreement are not works for hire under U.S. law, Consultant hereby assigns to District all copyrights to such works. With District's prior written approval, Consultant may retain and use copies of such works for reference and as documentation of experience and capabilities.

9. Required Governmental Submittals. Consultant understands and agrees that as part of Consultant's services, Consultant shall submit its studies, reports, and other work product to agencies of the State of California. Consultant shall make its best efforts to comply with all requirements of such agencies as to the format of such work product. Consultant's services hereunder shall not be considered complete as to any phase until the lead agency has reviewed and accepted, as to form, Consultant's work product.

10. Compliance With Laws. Consultant shall comply with all legal requirements relative to the Project. Consultant shall comply with state prevailing wage law, commencing with Section 1720 of the Labor Code and Section 16000 of Title 8 of the California Code of Regulations for any "public works" (as that term is defined in the statutes) performed on the Project funded by this Agreement. For purposes of compliance with prevailing

wage law, the Consultant shall comply with provisions applicable to an awarding body. Compliance with state prevailing wage law includes without limitation: payment of at least prevailing wage as applicable; overtime and working hour requirements; apprenticeship obligations; payroll recordkeeping requirements; and other obligations as required by law. Consultant shall certify to the District on each payment request form that prevailing wages were paid to eligible workers who provided labor for work covered by the payment request and that Consultant and all subconsultants complied with prevailing wage laws. Prior to the payment for each Phase of Consultant's services under this Agreement, Consultant shall submit to District a certificate signed by the Consultant and all subconsultants performing public works activities stating that prevailing wages were paid as required by law. In the event of any audit, Consultant shall cooperate fully and at Consultant's expense with all requests of the auditor.

11. Non-Discrimination Policy. Consultant shall not discriminate against any employee or applicant for employment, nor against any Sub-consultant or applicant for a subcontract, because of race, color, religious creed, age, sex, actual or perceived sexual orientation, national origin, disability as defined by the ADA or veteran's status. To the extent applicable, Consultant shall comply with all federal, state and local laws (including, without limitation, all District rules and regulations) regarding non-discrimination, equal employment opportunity, affirmative action and occupational-safety- health concerns, shall comply with all applicable rules and regulations thereunder, and shall comply with same as each may be amended from time to time. Consultant shall provide all information reasonably requested by District to verify compliance with such matters. Consultant stipulates, acknowledges and agrees that District has the right to monitor Consultant's compliance with all applicable non-discrimination requirements, and may impose sanctions upon a finding of a willful, knowing or bad faith noncompliance or submission of information known or suspected to be false or misleading.

12. Termination and Suspension. District may direct Consultant to terminate, suspend, delay or interrupt Services, in whole or in part, for such periods of time as District may determine in its sole discretion. District may issue such directives without cause. District will issue such directives in writing, and compensate Consultant shall be paid for services satisfactorily rendered, subject to District's reasonable approval, through the date of termination. Consultant may recover no other cost, damage, or expense. Suspension of Services shall be treated as an excusable delay. District may terminate performance of the Services under this Agreement in whole, or from time to time in part, for default, should Consultant commit a material breach of the Agreement, or part thereof, and not cure such breach within ten (10) calendar days of the date of District's written notice to Consultant demanding such cure. In the event District terminates the Agreement for default, Consultant shall be liable to District for all loss, cost, expense, damage and liability resulting from such breach and termination. Consultant shall continue its work throughout the course of any dispute, and Consultant's failure to continue work during a dispute shall be a material breach of this Agreement. Either party's waiver of any breach, or the omission or failure of either party, at any time, to enforce any right reserved to it, or to require strict performance of any provision of this Agreement, shall not be a waiver of any other right to which any party is entitled, and shall not in any way affect, limit, modify or waive that party's right thereafter to enforce or compel strict compliance with every provision hereof.

13. Public Records Act. Both parties understand and agree that District must comply with the California Public Records Act ("Act"). If Consultant believes that any document or information furnished to District in connection with Consultant's performance of services is exempt from public disclosure under the Act, it shall so advise District in writing at the time the document or information is furnished.

14. Survival. Without limiting any of the parties' other rights or obligations arising from this Agreement, and in addition to all other provisions indicated as surviving the termination or expiration of this Agreement, the following provisions will survive any termination or expiration hereunder: 3, 4, 5, 7, 8, 10, 11, 12 and 13.

15. Execution: Venue: Limitations: Miscellaneous. This Agreement shall be deemed to have been executed in the County of Lake, California. Enforcement of this Agreement shall be governed by the laws of

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the State of California, excluding its conflict of laws rules. The exclusive venue for all litigation arising from or relating to this Agreement shall be in the County of Lake. Except as expressly provided in this Agreement, nothing in this Agreement shall operate to confer rights or benefits on persons or entities not party to this Agreement. As between the parties to this Agreement, any applicable statute of limitations for any act or failure to act shall commence to run on the date of District's issuance of the final Certificate for Payment, or termination of this Agreement, whichever is earlier, except for latent defects, for which the statute of limitation shall begin running upon discovery of the defect and its cause. Captions to sections and subsections are for the convenience of the parties, and are not to be considered when construing this Agreement. The agreements contained herein shall not be construed in favor of or against any party, but shall be construed as if all parties prepared this Agreement. All terms not otherwise defined in this Agreement shall have the meanings provided in the Appendices or, if applicable, in the construction contract with the general contractor on the project.

16. Attorneys' Fees. If either party institutes or is required to defend any legal proceeding, action or motion to enforce, interpret or rescind the terms of this Agreement, the prevailing party shall be entitled to recover all costs and expenses, specifically including, but not limited to, reasonable attorneys' fees.

17. ADA Compliance. If, in the course of conducting the Services subject to this Agreement, Consultant offers a public program, service, or meeting on behalf of the District, Consultant shall, in accordance with the Americans with Disabilities Act and California law, offer its public programs, services and meetings in a manner that is readily accessible to everyone, including individuals with disabilities and shall, upon reasonable request provide reasonable accommodations for persons with disabilities including information or materials in appropriate alternative formats.

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ATTACHMENT A

Appendix A to Contract For Consulting Services

INSURANCE REQUIREMENTS

Consultant shall carry all of the following insurance and shall comply with the following requirements:

Commercial General Liability Insurance, written on an "occurrence" basis, which shall provide coverage for bodily injury, death and property damage resulting from operations, liability for slander, false arrest and invasion of privacy, blanket contractual liability, broad form endorsement, and products & completed operations, personal and advertising liability, with limits of not less than \$1,000,000 each occurrence and \$2,000,000 general aggregate, subject to a deductible of not more than \$25,000 payable by Consultant, and Excess/Umbrella Liability Insurance with limits of not less than \$1,000,000 per occurrence and \$1,000,000 aggregate.

Commercial automobile liability insurance with limits of not less than \$1,000,000 each occurrence including coverage for owned, scheduled, hired and non-owned autos.

Workers' Compensation and Employers' Liability Insurance in at least such amounts as are required by law. Consultant's Workers' Compensation Insurance policy shall, by endorsement, contain a Waiver of Subrogation as to each named and additional insured.

In the event Consultant is self-insured, Consultant shall furnish a Certificate of Permission to Self-Insure, signed by Department of Industrial Relations Administration of Self-Insurance, State of California.

In the event the Consultant does not have any employees as defined under the State of California Workers' Compensation laws, Consultant shall sign the District's "Workers' Compensation Certificate for Independent Contractors", which states:

Contractor hereby certifies that he/she/it is aware of the provisions of Section 3700 of the Labor Code of the State of California, which requires every employer to be insured against liability for workers compensation or to undertake self-insurance in accordance with the provisions of that code, and will comply with such provisions before commencing the performance of the work of this contract.

In addition, Contractor represents that he/she/it does not presently employ anyone in the manner subject to the workers' compensation laws of the State of California and that if Contractor does employ any such person during the time Contractor is performing this contract, Contractor will promptly provide the District with proof of workers' compensation insurance in the amount required by law.

Professional Liability Insurance with limits not less than \$1,000,000 each claim and \$1 million annual aggregate, all with respect to negligent acts, errors or omissions in connection with services to be provided by or on behalf of the Consultant under this Agreement, including contractual liability coverage to the extent insurable, and any deductible not to exceed \$25,000 for each claim, with no exclusion for claims of one insured against another insured. Consultant shall maintain said insurance coverage for a period of ten (10) years after the completion of the construction of the project for which Services are provided and shall, upon request of District, provide certificates of insurance evidencing Consultant has maintained said coverage. The policy shall have a retroactive date (prior acts coverage) that precedes the start of the design services under this Agreement, and the Consultant shall provide a copy of the declarations page showing the retroactive date.

Certificate(s) of Liability Insurance:

Acceptability of Insurers – Insurance is to be placed with insurers authorized to do business in the State of California and have a current A.M. Best rating of no less than A X or equivalent or as otherwise approved by the District. Certificate(s) of Liability Insurance shall include the A.M. Best or NAIC number for each insurer.

A notation of "All Operations" or the Bid Number and/or Job Title must be included on the certificate(s) and on all endorsements. (Note: "All Operations" covers all current and future operations with the District. Minimum coverage must be in accordance with bid or contract specifications.)

The Certificate Holder shall read as follows:

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Clearlake Oaks County Water District
P. O. Box 709
Clearlake Oaks, CA 95423

Written notice of cancellation, non-renewal or of any material change in the policies shall be mailed to District thirty (30) days in advance of the effective date thereof, except in the event of cancellation due to non-payment of the premiums, the notice of cancellation shall be mailed within ten (10) days.

The authorized Insurance Agency Representative's original signature is required on the Certificate of Liability Insurance.
Endorsements - Insurance policies shall contain an endorsement containing the following terms:

Additional Insured endorsements: Provide separate additional insured endorsements for the Commercial General Liability, Excess/Umbrella Liability and Commercial Auto Liability policies that contain the following terms:

CLEARLAKE OAKS COUNTY WATER DISTRICT, its Board of Directors, officers, employees, representatives, consultants (including without limitation Engineer) and agents, shall be named as additional insureds, but only with respect to liability arising out of the activities of the named insured.

A Statement of Additional Insured Endorsement on the Acord Certificate of Liability Insurance form is insufficient and will be rejected as proof of the additional insured requirement.

Primary / Non-contributory endorsement - Insurance shall be primary insurance and no other insurance or self-insured retention carried or held by any named or additional insureds other than Consultant shall be called upon to contribute to a loss covered by insurance for the named insured.

Waiver of Subrogation - Consultant's Workers' Compensation Insurance policy shall contain, by endorsement, a Waiver of Subrogation as to each named and additional insured.

Deductibles and Self-Insured Retentions - Any deductible or self-insured retention must be declared to and approved by the District prior to commencement of work.

The policies shall apply separately to each insured against whom claim is made or suit is brought except with respect to the limits of the insurer's liability.

Consultant shall ensure all Sub-consultants and any other person or entity assisting with provisions of this work shall maintain the same level of coverages specified in these insurance requirements at all times during performance hereunder.

Consultant shall, upon request of District, deliver to District such policy or policies of insurance and the receipts for payment of premiums thereon.

Continuation of Coverage - All said insurance shall be maintained by the Consultant in full force and effect during the entire period of performance.

Renewal certificates must be received by the District at least ten (10) days prior to the expiration date in agreement to ensure continuation of contract.

All correspondence and renewal certificates may be e-mailed to an email address provided to Consultant for that purpose by District or, if none, shall be mailed to:

Clearlake Oaks County Water District
P. O. Box 709
Clearlake Oaks, CA 95423

Other than Professional Liability, any insurance policy written on a claims-made basis is subject to the approval of the District.

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ATTACHMENT B – SCOPE OF WORK & INCORPORATED DOCUMENTS

1. The Planning Completion date is hereby established as July 31, 2017.
2. The Planning is for the eventual construction project known as the **Wastewater Treatment Plant Study Project**.
3. The Recipient agrees to ensure that its final Request for Disbursement is received by the Division no later than July 31, 2017, unless prior approval has been granted by the Division. Otherwise, the undisbursed balance of this Agreement will be de-obligated.
4. The tentative Planning schedule is summarized as follows:

MILESTONES	DRAFT	FINAL
Eligible Start Date	N/A	February 15, 2015
Phase I: Record Search and WWTP Operational Procedures Evaluations	N/A	July 1, 2016
Phase II: Base Mapping, Process Flow Analysis, and Modeling	N/A	November 1, 2016
Phase III: Equipment Condition and Efficiency Evaluation	N/A	January 1, 2017
Phase IV: Deficiency Report and Recommendations	N/A	February 1, 2017
Phase V.a: Facilities Plan Project Report	March 1, 2017	April 30, 2017
Phase V.b: Environmental Documents	May, 2017	June 30, 2017
Phase VI: Recycled Water Project Evaluation	January 1, 2017	March 31, 2017
Final Disbursement Request/End of Draw	N/A	July 31, 2017

5. Scope of Work

The Central Valley RWQCB issued CAO Order No. R5-2014-0707 (Order) in October 2014 to address deficiencies in the wastewater collection and treatment systems caused by aging infrastructure and lack of maintenance of the facilities. The Order requires the District to evaluate the current state of the wastewater collection and treatment facilities, and to implement improvements to protect water quality and reduce the risk of sewage spills into Clear Lake.

The District has broken up this task in six phases.

- **Phase I: Record Search and WWTP Operational Procedures Evaluations**
 - Collection of all operational records of the WWTP over the last 15 years along with any as-built drawings and other plans of system improvements
 - Interviews will be conducted to document past and present operations
- **Phase II: Base Mapping, Process Flow Analysis, and Modeling**
 - Preparing an initial base map
 - Conducting evaluation of the hydraulic and organic loading of WWTP
 - Initial ground survey to record elevations, inverts, control points, benchmarks
 - Reviewing Phase I data and developing influent and effluent water quality data
 - Lab testing to evaluate the unit processes and overall plant operations
 - Process flow diagrams and modeling

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- **Phase III: Equipment Condition and Efficiency Evaluation**
 - Evaluation and a condition assessment of all pertinent treatment plant equipment including pumps, motors, structures, electrical and control systems, buildings and chemical feed equipment
 - Review of electrical panels, controls, and pertinent motorized and non-motorized equipment

- **Phase IV: Deficiency Report and Recommendations**
 - Preparing deficiency report that includes the findings from phases I-III
 - Recommendations for improvements and upgrades for each treatment process and pertinent equipment
 - Condition assessment will include the energy efficiency and life expectancy

- **Phase V: Facilities Plan (Project Report and Environment Documents)**
 - Preparing project report under the CWSRF guidelines
 - Preparing appropriate CEQA documents based on the chosen cost effective alternatives

- **Phase VI: Recycled Water Project Evaluation**
 - Assessing additional treatment facility and related end user requirements
 - Identifying adequate end uses and related wet weather storage and conveyance needs in order to replace reliance on the LACOSAN discharge facilities if necessary
 - Preparing a water balance to evaluate worse case effluent storage volumes and disposal/irrigation requirements
 - Evaluating water quality to protect groundwater and surface sources
 - Preliminary locations of proposed storage facilities, conveyance lines and related study area characteristics
 - Preparing proposed construction financing plan and revenue program

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EXHIBIT B – PLANNING GRANT AMOUNT

1. The estimated reasonable cost of the total Planning exceeds two hundred ninety-nine thousand six hundred forty dollars and zero cents (\$299,640).
2. Subject to the terms of this Agreement, the State Water Board agrees to provide Planning Funds in the amount of exceeds two hundred ninety-nine thousand six hundred forty dollars and zero cents (\$299,640).
3. The Eligible Start Date is February 15, 2016. No costs may have been incurred prior to this date.
4. The End of Draw date is July 31, 2017. All disbursement requests must be submitted to the Division such that they are received prior to this date. Late disbursement requests will not be honored. In accordance with Section VIII.C of the Policy, the Deputy Director of the Division or designee may approve up to a 180-day extension of the End of Draw Date for good cause.
5. The Recipient must complete the planning process and submit a complete application for CWSRF Program construction financing prior to approval of construction financing. Costs associated with the design and construction phases of the Project are not eligible for reimbursement under this Planning Grant.
6. Budgeted Planning costs are summarized as follows:

TYPE OF WORK	ESTIMATED COSTS
Phase I: Record Search and WWTP Operational Procedures Evaluations	\$36,560
Phase II: Base Mapping, Process Flow Analysis, and Modeling	\$69,870
Phase III: Equipment Condition and Efficiency Evaluation	\$16,790
Phase IV: Deficiency Report and Recommendations	\$24,830
Phase V.a: Facilities Plan Project Report	\$42,850
Phase V.b: Environmental Documents	\$27,570
Phase VI: Recycled Water Project Evaluation	\$81,170
TOTAL*	\$299,640
* Funds may be shifted between line items as needed. However, shifts must be approved by the Division and the sum of adjusted line items shall not exceed the total budget amount.	

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MC Engineering 2016 Standard Billing Rates

<u>Title</u>	<u>Hourly Rate</u>
Senior Engineer/Principal (PE).....	\$150.00
Operations Management Engineer (PE).....	\$140.00
Data Analyst (PE, PhD).....	\$155.00
Operations Specialist (Certified Operator).....	\$95.00
Project Engineer (BSME).....	\$110.00
Meter Testing and Leak Detection Specialist.....	\$953.00
Engineering Technician.....	\$65.00
Administrative Assistant.....	\$55.00
Lodging and Meals (at cost plus 10%)	
Reproduction (at Cost plus 10%)	
Mileage, Travel, etc. (Standard IRS rates)	

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PLAN OF STUDY

for the

Clearlake Oaks County Water District
Wastewater Treatment Facility Proposed Improvements

Prepared By: MC Engineering, Inc.

Prepared For: Clearlake Oaks County
Water District

Prepared For: SWRCB Div.of Financial
Assistance SRF Planning
Grant

Date: September 17, 2015

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SECTION 1 Project Background and Location:

The Clearlake Oaks County Water District (District) was formed in 1960 under section 300000 *et seq.* of the California Water Code and is located on the north-east shore of Clearlake in Lake County, California. The District currently serves the unincorporated community of Clearlake Oaks, which has an estimated population of 2,359, based on the 2010 US Census. It is a popular summer destination as it is located directly on Clear Lake, a popular location for water sports and fishing. The District owns and operates the wastewater treatment plant and collection system, as well as the water treatment plant and water distribution system. Effluent from the wastewater treatment plant is pumped through a shared pipeline, with LACOSAN, to The Geysers, a complex of 22 geothermal power plants, south of Clearlake, near Middletown, CA.

A Wastewater Preliminary Engineering Report (PER) was prepared in 2014 for the USDA Rural Development and examined the current state of the wastewater treatment and collection infrastructure owned and operated by the District, which included minimal field investigations, document research, and staff interviews. Based on the findings a plan of action and cost effective solution(s) were recommended for those serious deficiencies and inefficiencies found within various components of the WWTP. A list of those identified projects and associated alternatives have been recommended. Other treatment plant components and processes were identified but due to the lack of detailed process evaluations and modeling they were considered future improvements.

The USDA Preliminary Engineering Report (PER) was prepared by MC Engineering, Inc., in accordance with the guidelines provided by the United States Department of Agriculture (USDA) Rural Development Agency (RDA) to meet Code of Federal Regulations (CFR) Part 1780 as part of the funding application for proposed projects. The USDA guidelines require the analysis and implications of project related factors that include, but are not limited to the following: environmental impact(s), project sustainability, technical feasibility, water and energy efficiency, economic feasibility, life-cycle analysis, and the awareness and support of the general public.

The project proposed in this report is located in and around the City of Clearlake Oaks, CA. Clearlake Oaks is approximately 40 miles north of Santa Rosa in Lake County and is located on the southeastern shore of Clear Lake. Clearlake Oaks is approximately 2.1 square miles in size, with an average elevation of 1,335 feet above sea level (US Census, USGS). An aerial photo (Figure 1) is presented below and shows the extent of the District service area and the location of the water and wastewater treatment plants.



Figure 1, Aerial of Service Area and Infrastructure Locations

Clearlake Oaks is a Census Designated Place (CDP) located in Lake County, CA. According to the California Department of Finance, Lake County has grown by 0.2% from 2012 to 2013. The California Department of Finance tracks population data for Lake County as a whole, and for two communities in Lake County—Clearlake and Lakeport. Population trends for Lakeport may be used as an indication of similar trends in Clearlake Oaks as both communities are similar in size and are located in the same geographic region. Population data for Lake County is shown below, in Table 1.

Table 1
Population Data, Lake County

Location	2012 Population	2013 Population	Percent Change
Lake County	64,412	64,531	0.2
Clearlake	15,179	15,192	0.1
Lakeport	4,705	4,713	0.2
Balance	44,528	44,626	0.2

Source: California Department of Finance

According to the 2010 US Census, the Clearlake Oaks CDP had a population of 2,359. This is down from a population of 2,402 as recorded by the 2000 US Census. In 2010, the median age in Clearlake Oaks was

54.9. It should be noted that approximately 23% of the housing of Clearlake Oaks is classified as seasonal, recreational, or occasional use (US Census). This is due to the fact that many residents are present in the summer for vacation. Table 2, below, details US Census data for the Clearlake Oaks CDP.

Table 2
US Census Data for Clearlake Oaks CDP

US Census Year	Population
2010	2,359
2000	2,402
1990	2,419
Total housing units – 1,823	
Housing units- seasonal, recreational, or occasional use – 427	
Percentage of housing for seasonal, rec., or occas. use – 23%	

Median Household Income (MHI) for the Clearlake Oaks CDP as reported by the 2008-2012 American Community Survey is \$29,057 (Confirmed by memo from SWRCB, dated 9/1/2014).

The District operates a secondary standard wastewater treatment plant, which was constructed in 1966. The plant includes headwork's, and metering with screening of coarse materials, biological secondary treatment for removal of soluble organic material and suspended material, chlorination for disinfection prior to discharge, solids handling, and effluent disposal to the Geysers. The WWTP was modified in 2001 with the addition of the effluent pipeline project.

The WWTP operates under CRWQCB Discharge Requirements Order No. 98-211, which allows for an average dry weather flows (ADWF) of .5 MGD and the maximum daily flow shall not exceed 2.1 MGD. It also sets the effluent 30-day average for BOD and SS levels at 40mg/l and 40mg/l, respectively. However, on various occasions the peak flows have exceeded the design capacity of the WWTP, and more recently, in the spring of 2011, peak flows exceeded the 2.5 mgd and there has also been intermittent past water quality violations, both at the treatment plant and from raw sewage overflows within the collection system. Table 3 contains a brief construction history of the District's wastewater facilities. Figure 3, below provides an aerial of the WWTP.

1.6.15

Table 3
Clearlake Oaks Water District
Wastewater System Previous Improvement Projects

System Component	Date Constructed	Date Upgraded	ADWF Design Capacity (1)
Effluent Disposal/Pump Sta.	2001	2001	2-3 MGD
Wastewater Treatment Plant			
Headworks/metering	1967	2001(minor)	.5 MGD
Oxidation ditch	1967	2006(minor)	.5 MGD
Partially mixed lagoon	2001	N/A	.5 MGD
Secondary Clarifier	1967	1980	.3 MGD
Sludge drying/disposal	1967	2001(new bed)	.5 MGD
Disinfection CL2 basin	1967	2001(basin)	.5 MGD
Wastewater Lift Stations	1966-1980	(Appendix B)	Unknown
Collection System	1964-1975	Varies	Unknown

(1) Data obtained from CLOCWD WWP O&M Manual dated December 1999



Figure 3, Wastewater Treatment Plant Aerial

As a part of the PER, dated July 2014, MC Engineering provided a preliminary level review of the existing conditions of the District's wastewater facilities including: wastewater treatment and disposal, sludge drying and disposal, lift stations, collection system, and operational management. It should be noted that due to the lack of a process flow evaluation and modeling along with a detailed list of past documented WWTP improvements and as-built drawings, MC Engineering was unable to recommend a more detailed list of specific construction improvement recommendations. Obvious improvements such as the clarifier and need for

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sludge disposal were two components that had apparent operational problems, primarily due to age and lack of capacity.

The wastewater collection system was constructed over a 15 year period, starting in 1966. It is comprised of 4, 6, 8, and 10, inch sewer laterals and mains. House services typically consist of 4-inch service laterals. Commercial establishment's service laterals are typically 4 and 6 inch pipes. The pipelines are a combination of vitrified clay pipe (VCP), ductile iron (DI) pipe, and asbestos-concrete (AC), with a majority of the pipe being AC. An approximate breakdown of pipe line sizes and lengths are as noted below, in Table 4:

Table 4
Estimated CLOCWD Collection System Pipeline Lengths
(Pipe types unknown)

Line Size	Length
4"	3,160
6"	84,840
8"	9,840
10"	6,820
12"	4,820
15"	1,141
Total	110,621

There are twelve collection system basins with gravity flow to a single lift station. These basins range in size from 25 dwelling units to as many as 1400. Each lift station is connected to various force mains ranging in size and length, from 6 to 8 inches and 10 feet to 330 feet in length, respectively. Some of the basins collect waste flows from commercial businesses, which are required to remove grease on-site. To address I/I problems within the collection system, the SWRCB awarded a \$399, Planning Grant (2014) to the District to perform an SSES to address raw sewer overflows at lift stations and within the collection system. Funding was also provided to develop a much needed and accurate mapping system to provide the necessary platform for the operations staff to properly operate and maintain their collection system and lift stations.

The wastewater facilities are governed and monitored by various governmental agencies and regulations and actions; including and not limited to:

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- **CRWQCB Cleanup and Abatement Order R5-2014-0707 issued in October 2014**
- California Regional Water Quality Control Board- WD-Order No. 98-211
- State Water Resources Control Board – Orders No. 2006-0003 and 2013-0058 State Water Resources Control Board – Title 22 (effluent disposal)
- California Code of Regulations (CCR) Title 23-hazardous/Title 27 -non-hazardous (sludge disposal)
- United States EPA (CFR) – Title 40, Part 503 (sludge disposal)
- California Department of Public Health (potable water)
- Lake County Department of Environmental Health (hazardous storage & risk assessment)
- National Electrical Codes-NEC (lift stations and WWTP)
- California Code of Regulations-CCR’s- Title 8-Cal/ OSHA (safety)

SECTION 2: Existing and Eminent Water Quality Problems and Need for Project

The California Regional Water Quality Control Board issued a **Clean-up and Abatement Order R5-2014-0707 in October of 2014**. This order requires the District to make necessary evaluations and improvements to their WWTP, collection system, and lift stations. To address this order, the District has acquired a \$2,831,000 loan and a \$1,060,203 grant from the USDA to make various improvements at their WWTP, lift stations, and within the collection system. There are still further evaluations necessary to eliminate potential water quality threats at the WWTP that were not included within the request for USDA grant/loans. Listed below are the various treatment plant components that are recommended for further evaluation under this proposal (Plan of Study). Under this study, a more detailed preliminary design will need to be performed to thoroughly evaluate the operational deficiencies of the WWTP.

A very important component of this study will be to evaluate future effluent and reclamation disposal alternatives which have become a major consideration of the District, as a result of current effluent disposal agreements between the Clearlake Oaks County Water district and the Lake County Sanitation District (see Section 1, above). There are various agreements that stipulate the acceptance and use of reclaimed water from associated sanitation and water districts located around Clear Lake. Some of the existing terms and conditions in in these agreements pose a significant threat to the District as it relates to the District’s ability to meet future waste discharge requirements and ultimately avoid serious violations. Below are excerpts and a summary of two key effluent agreements and the potential threat they pose to the District:

1. **Joint Operating Agreement for the Southeast Geysers Effluent Pipeline Project, between the Lake County Sanitation District, Northern California Power Agency, Union Oil Company of California, NEC Acquisition Company and Thermal Power Company, and the Calpine Geysers Company L.P., dated July 25, 1995**

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2. Agreement for the Acceptance of Effluent from the Clearlake Oaks County Water District, between the Clearlake Oaks County Water District and the Lake County Sanitation District, dated July 21, 1998

The Joint Operating Agreement between the LACOSAN and the power consortium, above, has a term of twenty five (25) years unless the agreement is terminated per conditions within Section 8 of the agreement. Section 8 states that *"If suspension of operations for the reasons listed in Section 7 or Section 16 would be protracted, or the cause cannot be practically remedied, or if economic conditions make continued operations impractical, Steam Suppliers may terminate this Agreement at any time during the term thereof upon two years prior written notice to LACOSAN, or this Agreement may be terminated sooner if agreed upon by all Parties. However, such notice may not be given during the first three years following the initial commencement of delivery, as referred to in Section 5.4.1"*.

The Agreement for Acceptance of Effluent between the District and the LACOSAN, above has a term of twenty (20) years, unless the agreement is terminated per conditions within Section 8 and 9 of the Agreement. A key concerning condition/provision of the agreement is found in Section 8, first paragraph, which states, *"The District's rights, granted in this agreement, to dispose of its effluent using the Geysers Pipeline may be suspended at any time by the LACOSAN, acting on behalf of itself or the Steam Suppliers for the following reasons.."*. These reasons include and are not limited to; *"1) If at any time during the term of this Agreement a Federal, State, or local governmental agency concludes that the injection of effluent is causing significant adverse health, safety, or environmental effects"* and *"2) If Steam Suppliers conclude that the operations are causing interference with their steam production or adverse effects upon steam quality or their geothermal facilities"*.

Both agreements, as noted above, pose potentially serious threat for the District's ability to dispose of its effluent to the regional effluent pipeline. Certain conditions, "out of the control" of the District could exist where the District's ability to meet it waste discharge requirements is severely impacted. It is therefore recommended that the District take necessary steps to prevent a serious health and safety issue, by developing other reasonable and cost effective solutions for disposing of their effluent in conjunction with other potential reclamation users in and around the District. These beneficial uses would also address storage and long term disposal guarantees.

1. Headworks (1967): (IMMEDIATE NEED): The headworks consists of an outdated, dilapidated automated mechanical cleaning to remove large solids and debris metering with a parshall flume and an isolation gate valve to split influent flows. Plant staff has experienced problems trying to calibrate the existing parshall flume flow meter due to the existing configuration. A new flume or alternative metering device is needed. The immediate need is to replace the isolation valve which is over 45 years old. Improving the overall function of the headworks is

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critical for meeting WD Requirements. The new valve will be sized to accommodate a small amount of future growth within the District. The USDA Rural Development Agency grant/loan will only address the need for a new flow isolation valve, since the existing valve fails to work. A more detailed evaluation of the headworks needs to be performed to address metering and solids removal issues.

2. Equalization Basin: N/A

3. Oxidation Ditch (1967): (IMMEDIATE NEED) This process consists of an outdated racetrack shaped concrete basin that utilizes mechanical aeration to reduce biodegradable organics. The process efficiency is measured by the level of the mixed liquor suspended solids (MLSS) concentrations, which typically should be around 2500 mg/l. This process is a very critical treatment component for meeting WD requirements and has also been an on-going maintenance problem for the operators. The aeration process, which utilizes two brush aerators/rotor brushes, requires extensive maintenance. This is a common occurrence for this type of process. The aerators are 10 hp and transfer between 1500 to 1800 pounds of oxygen to the mixed liquor per day. The District brush aerators are constantly breaking down and, if not immediately repaired, can seriously impact the plant's ability to meet the effluent BOD requirements of 40mg/l. When working properly, the existing capacity of the oxidation ditch is adequate to meet its design capacity of .5 MGD ADWF, which allows for approximately 400-600 new single family connections. Due to the on-going maintenance problems, it is highly recommended that District look at a modern day design. If it is determined that constructing a new Oxidation Ditch is not feasible, then at the very least, it is important to clean the concrete oxidation ditch basin to remove accumulated debris in order to free up much needed capacity/retention time. A more thorough evaluation of the oxidation will need to be performed under this proposal to evaluate the rotor brush and efficiency along with structural issues in concrete basin.

4. Secondary Clarifier (1967): (IMMEDIATE NEED) The existing clarifier is 33 feet in diameter and was constructed in 1966, with pre 1960 design technology. This process removes and separates the heavier settleable and floatable material from the mix liquor suspended solids. Non-settled mixed liquor travels over a series of weirs where it is then transported to the disinfection process and/or aerated lagoons. The settled or heavier sludge (sludge blanket) is then pumped, as returned activated sludge (RAS) back to the oxidation ditch. Portions of the waste activated sludge (WAS) are routinely pumped/wasted to the drying beds from the clarifier to maintain a target MLSS concentration and SRT.

This single clarifier has been a constant source of problems and is a serious concern due to its old and deteriorated condition and age (> 45years old). The equipment is rusty and has experienced on-going mechanical failures (clarifier mechanism gears). The condition, along with the fact that the current clarifier is under-designed for the existing design flows due to a shallow depth and other flawed design features, make its replacement critical. To compensate for the old clarifier, the operator's by-pass flows to the aerated lagoon as designed. This by-passing requires constant oversight and is a "band-aid" solution to a process (clarifier) needing immediate replacement to prevent overloading and solids carryover. The wet-weather I/I peaks along with backwash water from the water plant have stretched the capability of this process to

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function properly which seriously impacts the District's ability to meet waste discharge requirements.

No safety measures have been taken to prevent injury therefore; safety requirements must be evaluated immediately.

The USDA Rural Development Agency has approved the design and construction of a new secondary clarifier within the approved grant and loan.

- 5. Return Activated Sludge (RAS) Pump Station: (IMMEDIATE NEED) This process is currently utilizing an old sump basin and pump that is improperly designed to convey RAS back to the oxidation ditch along with valving to transfer waste activated sludge back to the sludge drying beds. The station is more than 45 years old and is improperly designed by current standards. Operators have also had problems operating pumps during peak flow periods. The existing pumps are over 15 years old, undersized, and have met their useful life. These pumps will need to be re-sized if and when a new clarifier is constructed. This RAS pump station is a very important element of the overall WWTP process and without new pumps and railings, the operators will not be able to properly meet design flows and provide immediate repair and maintenance safely. The RAS pump station is at capacity and is not adequate to meet the demands from a new clarifier and any additional ADWF flows. The new clarifier should be designed to include a new dedicated RAS pump station.

The Sludge Pit is located in the front of the property raising safety concerns. No safety measures have been taken, leaving un-safe conditions for people and animals. Safety requirements must be met immediately. Ultimately, the USDA Rural Development Agency grant/loan will provide for design and construction of a new RAS pump station.

- 6. Partially Mixed Lagoons (aerated): (IMMEDIATE NEED): There are two partially mixed lagoons, each having a volume of 400,000 gallons, with each lagoon having two surface aerators. These aerated ponds were constructed as a part of the effluent pump station and pipeline project in 2001. This process was constructed to augment the existing clarifier in order to meet total suspended solids (TSS) and settle-able solids requirements while providing longer solids retention times and sludge stabilization. The aerators also help maintain dissolved oxygen levels at or above 1.0 mg/L. The ponds currently handle flows from the clarifier, working as finish ponds. If and when a new properly sized clarifier is constructed, the lagoons will still be used as finishing ponds. The liner in lagoon no. 2 is torn and if not replaced will get under-mined by partially treated and non-disinfected wastewater and eventually the underlying ground water could become contaminated. The ponds are cleaned annually by removing settled solids. For continued use of the aerated lagoons it is important to repair/replace the torn liner. These lagoons should fall within the overall plant capacity of >0.5 MGD ADWF, and during excessive peak flow periods provide the necessary redundancy to achieve water quality compliance. Accumulated sludge from the lagoons is pumped to the drying beds and the filtrate is directed back to the oxidation ditch. This process is not working as designed and has limited use. It also has lining problems and further evaluation is recommended under this proposal.

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7. **Sludge Drying Beds (1967): (IMMEDIATE NEED):** The sludge drying facility was originally constructed in the 1960's. There are currently three usable drying beds with approximately 14,000 SF of area. These beds take waste activated sludge (WAS) from the clarifier for drying and are currently undersized. The sludge drying, prior to disposal, ranges from 70% -80% solids. The existing sludge drying beds are undersized and require more frequent disposal which can be expensive due to the existing hauling and landfill costs. The District's sludge disposal costs are quite high. The dried sludge is hauled to a hazardous materials landfill at a cost > \$ 35/ton. The sludge is sampled every six months and has high metals concentrations exceeding the disposal standards set for non-hazardous dumping. Metals found in the sludge with high concentrations are reportedly classified as "non-hazardous waste" but they require a Class B landfill. These are noted below:

- Arsenic
- Barium
- Chromium
- Lead
- Copper
- Mercury
- Nickel
- Thallium
- Vanadium
- Zinc

Currently there is a need to reduce the high operational cost for sludge disposal and provide the necessary drying times for the WAS. The current sludge drying beds also have a serious design flaw. They have a center drain that is made of permeable material with the ability to impact and contaminate groundwater. Drain isolation valves were requested by plant staff.

Additional sludge storage, along with constructing new concrete center drains and aprons for the three existing sludge beds, is highly recommended to improve health and safety issues as well as reduce sludge hauling costs. It is highly recommended that the District take an aggressive approach to locating the source of the high metals concentrations in the sludge while also pursuing its goal of reducing the weight of sludge hauled by providing additional drying time necessary to remove moisture.

The water treatment facility discharges all backwash waste flows to the sanitary sewer. The CLOCWD Operations Manager has emphasized the need to assess the impact of water treatment plant solids on the WWTP. Options explored in the recent USDA PER for the water system discuss this further. The impact of WTP solids at the WWTP will need to be evaluated further under this task. This will need to be evaluated more closely as to whether a new drying bed is needed. MC Engineering is proposing a detailed process flow and modeling evaluation of the WWTP as a part of this proposal.

8. **Chlorination Facilities (1967):** The existing primitive, sub-standard lined, contact chamber will reportedly need to be re-lined in 2019. With the potential of leaking, this was re-lined in the 2001 improvement project and the addition of the lined chlorine contact basin that has a liner

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with a limited life-span. It was noted that the chlorine feed system is not currently flow paced and the addition of this feature would reduce chemical costs. A more detailed evaluation of the chlorination facilities will need to be performed to address operational and structural issues.

- 9. **Emergency Effluent Storage Ponds:** The three existing in-line emergency storage ponds are capable of handling up to three million gallons of by-passed waste flows and treated sewage. Two of the three emergency ponds have been used in the past (March 2011 event) to handle excessive peak flows. In 2011 suction trucks reportedly dumped sewage directly into Emergency Pond No. 4 and the clarifier effluent pump station. A 6" high-volume diesel engine driven pump was required to pump excess flows from the clarifier effluent pump station to Emergency Pond No. 4. The ability of the operators to more effectively by-pass influent flows after the headworks should be considered. This by-pass process (emergency only) would allow the plant to operate within its design capabilities while higher flows are routed for equalization in the emergency storage ponds. Once in the emergency ponds, the raw sewage could be aerated and/or stored for facultative treatment (min. depth 8 feet) and/or returned to the main process over time.

Three emergency ponds were originally constructed in 1966 as evaporation and percolation ponds. They have never been lined. It is unclear at this time, if the CRWQCB would allow raw by-passed sewage to be stored in the emergency lagoons. Utilizing the emergency ponds for raw sewage overflow during peak flow events may require clay or geo-membrane lining. One of the ponds could be used for emergency effluent storage in the event the effluent pump station fails. This option would have to be evaluated at a later date. The ponds may not percolate due to soil clogging in the past, so it is advisable at a later date, to check the permeability of the pond bottoms. Improper lining and sealing of the ponds could pose a threat to groundwater quality and violate the waste discharge permit. The existing ponds provide flexibility for current and future influent flows during peak periods. Modification of the flow isolation valve at the plant headworks should include an evaluation of bypassing flows to the emergency storage ponds. The ability of the emergency ponds to operate effectively will need to be furthered evaluated under this proposal. There are concerns with the lining, along with piping and valving to the ponds.

- 10. **Wastewater Reclamation Alternatives:** As described above, the District is in need of identifying viable waste discharge alternatives given the potentially volatile nature of the LACOSAN agreement combined with expressed interest from nearby potential recycled water users. This section of the Plan of Study includes an alternative evaluation that considers supplying water to nearby agricultural properties in lieu of discharging to the LACOSAN pipeline. In the event that a recycled water project is implemented, most, if not all of the facility improvements noted above will still be required at the WWTP in addition to several key process upgrades that are recommended to produce Title 22 tertiary effluent with limited restrictions on end uses. Additional evaluation of end uses is also required in order to comply with the recommended report requirements established by the State Water Resources Control Board.

Based on information obtained to date, at a minimum, the additional facilities needed at the District's WWTP, beyond what is described above, will include more a more robust biological process that should be capable of nitrification/denitrification, filtration, pumping, and adequate storage and process redundancy needed to comply with Title 22 requirements. The scope of work for these additional facilities, in addition to an assessment of the recycled water market

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and related storage and conveyance facilities, are outlined as added evaluations specific to a recycled water project in Section VI below.

SECTION 3 Scope of Work and Budget

Administration and Project Management

This work will include managing staff and sub-consultants, preparing monthly invoices, attending meetings to update CLOCWD staff, and preparing monthly project status updates for CLOCWD and State review and approval.

Phase I: Record Search and WWTP Operational Procedures Evaluation

This phase will include the collection of all operational records of the WWTP over the last 15 years along with any as-built drawings and other plans of system improvements and purchases. Interviews will be conducted to document past and present operations in order to gain a clear understanding and knowledge of the plant operations.

Deliverables: Additional record drawings, shop drawings, O&M manuals, historical flows, loadings, and water quality test results will be obtained and uploaded to the CLOCWD Central Desktop website currently maintained by MC Engineering. Conversations will be documented and included in the record.

Phase II Base: Mapping, Process Flow Analysis, and Modeling

This phase will include preparing an initial base map and conducting an evaluation of the both the hydraulic and organic loading of the WWTP. Initial mapping will include setting control and developing an aerial map to facilitate the planning effort. This will be followed by an initial ground survey to record critical elevations of processes, inverts, and establish key control points and benchmarks. After reviewing data from Phase I, a list of additional influent and effluent water quality data will be developed. Additional lab testing will be conducted and the data will be used as needed to evaluate the unit processes and overall plant operations. It will evaluate the efficiency of each plant process under both current and future conditions. Process flow diagrams and modeling will be performed.

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Deliverables: An aerial photo and initial base map will be prepared in Autocad format. A list of recommended testing requirements will be developed and additional lab results will be collected and analyzed. A spreadsheet or "Biowin" model will be developed to analyze current and projected plant unit processes and related improvements. A technical memo will be prepared with a base map of existing facilities. The memo will include a summary all flows and loadings, projected flows and loadings, and modeling results with recommended unit process improvements.

Phase III: Equipment Condition and Efficiency Evaluation

This phase will include the evaluation and a condition assessment of all pertinent treatment plant equipment including pumps, motors, structures, electrical and control systems, buildings, and chemical feed equipment along with a review of electrical panels and controls and pertinent motorized and non-motorized equipment.

Deliverables: A database of critical equipment items and unit processes will be developed and populated with critical information. Recommendations for each item will be included in a summary table along with estimated costs for replacement and/or repair.

Phase IV: Deficiency Report and Recommendations

Upon completing phases I-III, a deficiency report will be prepared that includes documenting the condition of existing facilities and recommended improvements and upgrades for each treatment process and pertinent equipment. The condition assessment will include evaluating the energy efficiency and life expectancy of the larger more critical unit processes and equipment with developing short and long term recommendations.

Deliverables: Information from Phases II and III above s will be summarized. This information, along with related narratives and descriptions, will be incorporated into the Deficiency Report and ultimately form the basis of the Facilities Plan under Task V below.

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Phase V: Facilities Plan (Project Report and Environmental Documents)

This phase will consist of preparing a project report under the SWRCB guidelines and will include descriptions of cost effective capital improvement projects to improve the overall WWTP efficiency and eliminate any existing or potential water quality violations. Appropriate CEQA documents will also be prepared, based on the chosen cost effective alternatives.

Deliverables: A Project Report will be prepared documenting all work noted above. Budget is based on preparing an amendment to the existing environmental document originally prepared for the USDA Preliminary Engineering Report.

Phase VI: Recycled Water Project Evaluation

The recycled water project evaluation will include assessing additional treatment facility and related end user requirements as recommended by the State Water Resources Control Board. The overall project goal will be to identify adequate end uses and related wet weather storage and conveyance needs in order to replace reliance on the LACOSAN discharge facilities if necessary. A water balance will be prepared identifying anticipated 1 in 100 and 1 in 10 year wet year impacts to evaluate worse case effluent storage volumes and disposal/irrigation requirements. Water quality objectives needed to protect surface and groundwater sources will be evaluated.

Preliminary locations of proposed storage facilities, conveyance lines, and related study area characteristics will be presented in the final report. Existing records of historic groundwater levels and water quality data will be used in lieu of any site specific drilling of monitoring wells at offsite locations to assess potential impacts to waters of the State.

The resulting financial analysis will include both the incremental increase in capital cost for the recycled water facilities and an assessment of additional chemical, energy and labor requirements. The evaluation will include an implementation plan that considers necessary agreements and ordinances, permit requirements, commitments from end-users, and a proposed implementation schedule. This information will be summarized in a proposed construction financing plan and revenue program if the project is deemed feasible.

Deliverables: A dedicated section related to the incremental cost of implementing a recycled water project will be included in the final report along with the base project report identified above. A detailed water balance along with maps of proposed reclamation sites, pipeline alignments and related facility requirements will be summarized in this section along with an evaluation of a minimum of two alternative biological processes, filtration alternatives, and

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disinfection options. Additional pumping and storage facility requirements will be identified and planning level locations for these facilities will be depicted on related maps.

Project Budget

A preliminary project budget is presented below. Costs for sub-contractors are included with an estimated markup by the prime consultant of 13%. It is assumed that costs can be re-allocated as needed among the various categories as the work progresses and more knowledge is obtained relative to each respective scope item.

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Task	PH	PE I	OM	PE II	OS	Admin/Tech	WCE Subtotal	SUBS	ODC	Summary
Project Management and Administration (Task A)										
Task 1.1. Records Search	48		8			24	\$9,880.00		\$1,000.00	\$10,880.00
Task 1.2. Operations Review										
Phase I: Records Search and Operations Review										
Task 1.1. Records Search	10	30	20		8			\$4,000.00	\$400.00	\$12,670.00
Task 1.2. Operations Review	14		18					\$8,000.00	\$500.00	\$13,270.00
Phase II: Mapping, Process Flow Analysis, and Modeling										
Task 2.1. Aerial Survey and Mapping	4	16	4		2		\$3,820.00	\$15,000.00	\$500.00	\$19,420.00
Task 2.2. Process Data Collection and Lab Testing	8	9	6		2		\$4,185.00	\$10,000.00	\$500.00	\$14,685.00
Task 2.3. Process Analysis and Modeling	22	9	18				\$7,645.00	\$25,000.00	\$500.00	\$33,345.00
Task 2.4. Base Map and Technical Memo	4	8	4		2		\$2,420.00			\$2,420.00
Phase III: Equipment Condition and Efficiency Assessment										
Task 3.1. Prepare Equipment Inventory	4	12	8		12		\$5,425.00			\$5,425.00
Task 3.2. Equipment Conditions Assessment	12		12		8		\$5,880.00		\$500.00	\$6,080.00
Task 3.3. Efficiency Evaluation	12		6		4		\$4,790.00		\$500.00	\$5,290.00
Phase IV: Deficiency Report and Recommendations										
Task 4.1. Develop List of Deficiencies by Unit Process	10	24	10		4		\$9,370.00		\$500.00	\$10,070.00
Task 4.2. Prepare Deficiency Report and Recommendations	20	24	32		4		\$14,260.00		\$500.00	\$14,760.00
Phase V: Facilities Plan and Environmental Document										
Cost Estimating	8	24	12		10		\$9,440.00			\$9,440.00
Draft Report	40	22	32		6		\$17,450.00			\$22,450.00
Final Report	24	12	24		8		\$10,960.00	\$5,000.00		\$10,960.00
Environmental IER Neg. Doc Amendments	8	2	4		4		\$2,570.00	\$25,000.00		\$27,570.00
Phase VI: Reclamation Facility Evaluation										
Additional Maps and Study Area Evaluations	8	24	12		2		\$8,500.00		\$500.00	\$9,000.00
Water Balance Study Characteristics and Related Facilities	12	12	6		5		\$8,210.00	\$5,000.00	\$250.00	\$13,460.00
Wastewater Treatment Requirements and Additional Process Evaluations	24	12	24		2		\$10,660.00	\$5,000.00	\$250.00	\$15,310.00
Recycled Water Market Evaluation	16	16	24		2		\$10,820.00		\$500.00	\$11,320.00
Alternatives Analysis	12	12	12		2		\$5,970.00		\$250.00	\$6,220.00
Recommended Project Description	12	8	8		2		\$4,970.00		\$500.00	\$4,970.00
Implementation and Operational Plans	8	8	8		4		\$4,290.00		\$500.00	\$4,790.00
Construction Financing and Revenue Program	12	8	12		4		\$5,290.00		\$250.00	\$5,540.00
Environmental IER Neg. Doc A-amendments	6	2	6		4		\$2,560.00	\$7,500.00	\$500.00	\$10,560.00
Total Project Budget										\$299,640.00

Abbreviations and Standard Hourly Rates:

- PM: Project Manager and Principal Engineer, Mark Carey, P.E. \$150.00 \$/hr
- PE I: Project Engineer I, Richard Relyea, BSMF \$105.00 \$/hr
- OM: Operations Management Specialist, John Pedri, PE \$145.00 \$/hr
- PE II: Project Engineer II, Steve Kline, PE \$110.00 \$/hr
- OS: Operations Specialist, Doyle Champlain \$90.00 \$/hr
- ADM: Administrative Assistant and Engineering Technician \$55.00 \$/hr

ODC: Other Direct Costs (travel including mileage reimbursed at applicable IRS rates, reproduction costs, etc.)